

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 69.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-004257**Date Inspected:** 16-Oct-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 2300**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 730**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**CWI Name:** Sun Bo, An Qing Xiang**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** OBG, Tower**Summary of Items Observed:**

Caltrans Quality Assurance (QA) Inspector, Ken Jobes, arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China, to randomly monitor welding and Quality Control (QC) functions. While on site, the QA Inspector observed and/or discovered the following:

OBG Sub-Assembly Shop – Bay 1

Caltrans Quality Assurance (QA) Inspector, Ken Jobes, was present to monitor activities associated with the Production Monitoring Test (PMT) of Orthotropic Box Girder (OBG) Deck Panel U-rib welds. The PMT representing Deck Panels DP109-001 and DP177-001 was monitored. After MT of the tack welds was accepted by ZPMC Level II MT Technician, Cai Xin Xin, the three ribs (six welds) were simultaneously welded to simulated deck plates in the horizontal groove (2G) welding position. The Welding Procedure Specification (WPS) used was WPS-B-T-2342-U1(Urib)-4. It is a combination procedure using gas metal arc welding (GMAW) for the root pass and submerged arc welding (SAW) for the cover or fill pass. The filler metals being used were verified to be as specified on the WPS; 1.4 mm diameter, ER70S-6 (JM-56) for GMAW and 4.8 mm diameter EH14K (H14) for SAW. During the test, the Caltrans QA Inspector recorded the parameters observed on the U-Ribs PMT Inspection Sheet, dated 10-17-08, for both welding processes. The name of the gantry operators and each of the welding operators' identification numbers were also recorded on the U-Ribs PMT Inspection Sheet. ZPMC Certified Welding Inspector (CWI), Sun Bo (08021741) and ABF QA Inspector Huang Wen Guang were present during welding.

The final weld was visually examined and accepted by ZPMC CWI, Sun Bo; and ABF QA Inspector Huang Wen

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Guang. All welds appeared to meet the specified visual examination acceptance criteria. After ultrasonic examination (UT) and acceptance by ZPMC Level II UT Technician, Xu Wei, the Caltrans QA Inspector designated the locations for the required macro-etch specimens. All macro-etch specimens were prepared and found acceptable by ZPMC CWI, and ABF QA Inspector. The macro-etch specimens were then examined by the Caltrans QA Inspector and the depth of penetration on each measured and the results recorded on Caltrans Project 04-0120F4 SAS OBG Fabrication Macro Etch Log.

All above observations appeared to meet the requirements of the job specifications.

The Caltrans Inspector also observed the tacking U-ribs to deck panel, DP487-001, which has five ribs. The tacks were approximately 75 mm long. They used the backhand (pull) technique and the angle of the gun varied during welding but was generally pointed toward the vertical member (U-rib). Sometimes they backfilled the crater and sometimes they did not. The WPS being used was WPS-B-T-2342-U2(U-rib). Globular was the predominant mode of transfer. The welder was Lu Liang (I. D. 059373). ZPMC Certified Welding Inspector (CWI), Sun Bo (08021741) and ABF QA Inspector Huang Wen Guang were monitoring this welding. The Caltrans Inspector verified that the filler metal, ER70S-6 (JM-56), and the diameter of filler metal (1.2 mm) were in compliance with the WPS, as was the voltage (29.2-29.8). The amperage varied considerably during the tacking from 250 amps to 375. The WPS range is 320 – 350. The average/mean amperage was probably close to this range. The gas flow rate was 22-23 liters/minute, which complies with the WPS. The machine settings were not changed during the period of observation. No cracking was observed.

Heavy Machinery (Tower) Shop 1

The Caltrans QA Inspector randomly observed the Submerged Arc Welding (SAW) of fill passes on Weld Nos. NSD1-SA18B/E-24B, 18, 4B, 20, 15B, 6 16B, 22 in the flat groove (1G) welding position. All of the welds are on the same joint and are numbered as such because they alternate partial joint penetration (PJP) and complete joint penetration (CJP) along the joint. The “B” welds are CJP and the welds without a letter designation are PJP. The two welding operators were Lu Xiu Xian (I. D. No. 040252) and Xu Xiu Shui (I. D. 0404890). The two Welding Procedure Specification (WPS) Nos. were WPS-B-T-2221-B-U3c-S-2 for the CJP and WPS-B-T-2321-P3-S-2 for the PJP. Certified Welding Inspector (CWI), An Qing Xiang (CWI No. 07120651) was present during this welding as was ABF Inspector, Ma Zhen Yi. The QA Inspector verified the qualifications of the welding operator, and that the electrode/flux classification, diameter of electrode, amperage, voltage, travel speed, and preheat/interpass temperatures were as specified on the WPS.

Heavy Machinery (Tower) Shop 2

The Caltrans QA Inspector randomly observed the machine Submerged Arc Welding (SAW) of cover passes on Weld No. WSD1-SA233A/H-60B. The welding operator was Yang Mei Zhen (I. D. No. 042195). The Welding Procedure Specification (WPS) was WPS-B-T-2221-B-U3c-S-2. Certified Welding Inspector (CWI), An Qing Xiang (CWI No. 07120651), was monitoring this welding, along with one ABF QA Inspector and one ZPMC QC Inspector.

Summary of Conversations:

As identified within the contents of this report.

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Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Peter Dautermann (1500219953) China, who represents the Office of Structural Materials for your project.

Inspected By:	Jobes,Kenneth
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Quality Assurance Inspector

Reviewed By:	Carreon,Albert
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QA Reviewer
